

## Unit 9 Review B

### Ch 34-35

**In addition to knowing vocab definitions, be sure you can apply them to understand the following:**

#### Ch 34

- Circulatory Systems
  - How do small, nonpolar molecules like O<sub>2</sub> and CO<sub>2</sub> move into and out of cells?
  - Explain the difference between each of the following:
    - Open vs closed circulatory systems
      - Where/how does the circulatory fluid move?
      - What types of organisms use each?
      - Which is less costly in terms of energy?
      - Which maintains relatively high blood pressure to deliver oxygen and nutrients to cells?
    - Arteries vs veins (direction....will get to size and pressure later)
    - Single vs double circulation (flow of blood, types of organisms)
    - Gas exchange vs systemic circuits
      - Which side of the heart pumps oxygen-poor vs oxygen-rich blood?
      - Where does this blood travel?
    - Pulmonary vs pulmocutaneous circuits
      - Where are the capillary beds found?
      - What types of animals use each?
    - The number and types of chambers in the hearts of
      - Frogs and other amphibians vs
      - Turtles, snakes, and lizards vs
      - Alligators, caimans, and crocodiles vs
      - Mammals and birds
  - Compare and contrast endotherms and ectotherms
- Cycles of Heart Contract
  - Be able to explain the pathway blood takes as it travels through the mammalian circulatory system
    - Be able to label a diagram of the heart!
      - Know the names of chamber, valves, and major arteries and veins
      - Which side is right vs left?
      - Which side carries oxygenated vs deoxygenated blood?
  - What is the difference in the form and function of atria vs ventricles?
  - What is the difference between systole and diastole?
  - How is cardiac output calculated?
  - What is the purpose of the four valves and where is each located in the heart?
  - What is the function of the sinoatrial vs atrioventricular node?
    - Which initiates atrial vs ventricular contraction?
    - What would happen if these nodes were damaged?
  - How does epinephrine affect the heart?

- Blood Pressure and Flow
  - Capillaries, Arteries, and Veins
    - Which are the smallest with the slowest velocity of blood flow? Why?
    - Which have thick walls? Why?
    - Which have valves? Why?
    - Where is blood pressure highest vs lowest?
  - Systolic vs Diastolic Pressure
    - Which occurs during ventricular contraction vs relaxation?
    - When is arterial blood pressure highest?
    - How does height affect systolic pressure?
  - How do vasoconstriction and vasodilation affect blood pressure?
    - How are these processes used to regulate blood flow during digestion vs exercise?
- Lymphatic System
  - What is the role of the lymphatic system?
  - Why do doctors check for swollen lymph nodes in the neck, armpits, and groin when sick?
- Blood Components
  - What is the function of plasma?
  - What are the cellular components of blood (common and scientific names)?
    - What are the functions of each?
    - How are they specialized to carry out these functions?
  - What are some disorders of the heart?
    - How do they develop?
- Gas Exchange
  - How do you calculate the partial pressure of oxygen?
  - Why does obtaining oxygen from water require more energy than air breathing?
  - How does temperature and salt content affect dissolved oxygen levels?
  - What types of organisms use a countercurrent exchange system to exchange gases?
  - What types of organisms use a tracheal system?
  - What process tips the epiglottis over the glottis in the pharynx to prevent choking?
  - Where does gas exchange take place in the lungs?
- Breathing
  - What is the difference between positive and negative pressure breathing?
    - How do mammals increase vs decrease their lung volume?
    - How does this affect pressure?
    - How does this affect movement of air and why?
  - Where is the main breathing control center in humans?
    - How does it regulate breathing?
    - Is this based on oxygen or carbon dioxide levels?

## Ch 35

- Innate vs Adaptive Immunity
  - What are the differences between innate and adaptive immunity
    - Types of organisms, timing, specificity, examples, etc.

- Innate Immunity
  - What are some defenses used by invertebrates vs vertebrates?
  - What are the 4 types of phagocytic cells in mammals?
  - Inflammatory response
    - What cells release histamine and why?
      - What are the side effects?
    - What is septic shock?
- Adaptive Immunity
  - Where are T cells vs B cells produced?
  - What are antigens? What are epitopes?
  - Is the recognition by a B/T cell general or specific?
  - What do B cells secrete and what is their function?
  - The antigen receptors of T cells bind only to what?
  - What is a MHC and why is it important?
  - Explain the 4 major characteristics of adaptive immunity
  - What is the result of clonal selection?
  - What are the effector form of B cells vs T cells?
  - What are the differences between effector and memory cells?
  - What are the differences between the primary and secondary immune response?
  - When exposed to the same pathogen more than once, why might a person get sick the first time but not the second time?
- Humoral vs Cell-Mediated Immune Response
  - What are the differences between the humoral and cell-mediated immune responses?
    - Which involve antibodies vs cytotoxic T cells?
      - What marks vs destroys pathogens?
    - How are helper T cells involved in both responses?
    - What is the order of events in such responses?
- Active and Passive Immunization
  - What are the differences between active and passive immunity?
    - Which requires direct exposure to the pathogen?
    - What are examples of each?
  - Why are annual vaccinations needed for some viruses?
- Immune Rejection and Disruptions
  - What molecules must match to minimize rejection in blood transfusions and organ transplants?
  - What are allergies and how does the immune system respond to them?
    - What is the function of antihistamines?
  - What are autoimmune diseases?
    - What are some examples?
  - How does some pathogens obstruct immune responses?
    - Give examples of such viruses and how they avoid destruction